**What is claimed is:**

1. Apparatus, for mounting on an aircraft, for detecting hazardous materials, comprising:

a global positioning system unit,

a heading module, and

a sensor having a probe, an electronics module, and means for measuring airspeed, said probe being mounted to protrude outside the skin of said aircraft, and including an enclosed, positive airflow, sensing chamber with a sensing element for a selected hazardous material mounted therein, said electronics module being connected to and configured to receive input from said global positioning system unit, said heading module, said sensing element and said means for measuring airspeed, said electronics module being configured to output data including position, altitude, wind velocity and hazardous material detection information,

whereby distribution of said selected hazardous material may be mapped and dispersion of said selected hazardous material may be predicted.

2. Apparatus as set forth in Claim 1 including a transceiver connected to said electronics module for transmitting said data to a ground network.

3. Apparatus as set forth in Claim 2 wherein said global positioning system unit and said electronics module are a combined unit.

4. Apparatus as set forth in Claim 1 wherein said probe has an airfoil shape, and includes an outwardly located flow tube opening in the direction of airflow with

said chamber being connected to and extending inwardly from said flow tube, and an inwardly located outlet hole connected to said chamber opposite said flow tube and opening transverse to the direction of airflow.

5. Apparatus as set forth in Claim 4 wherein said means for measuring airspeed includes a forwardly opening pitot tube and pair of spaced, side opening static ports, in said probe, all connected to a differential pressure sensor in said electronics module.

6. Apparatus as set forth in Claim 5 wherein said static ports are connected to a static pressure sensor in said electronics module.

7. Apparatus as set forth in Claim 1 wherein said probe includes a temperature sensor and a humidity sensor, each located in said chamber and connected to said electronics module.

8. Apparatus as set forth in Claim 1 wherein said sensing element is a plug-in, chip based hazardous agent sensor.

9. Apparatus, for mounting on an aircraft, for detecting hazardous materials, comprising:

a global positioning system unit,

a heading module,

a sensor having an airfoil shaped probe mounted to protrude outside the skin of said aircraft, and an electronics module, said probe having an outwardly located flow tube opening in the direction of airflow, an inwardly extending, enclosed, positive airflow, sensing chamber connected to said flow tube and at least one inwardly

located outlet hole connected to said chamber opposite said flow tube, opening transverse to the direction of airflow, a forwardly opening pitot tube, and pair of spaced, side opening static ports, said chamber having a plug-in, chip based sensing element for a selected hazardous material, a temperature sensor and a humidity sensor mounted therein, said electronic module having a static pressure sensor connected to said static ports and a differential pressure sensor connected to said pitot tube and said static ports, said electronics module being connected to and configured to receive input from said global positioning system unit, said heading module, said sensing element, said temperature sensor, and said humidity sensor, said electronics module being configured to output data including position, altitude, wind velocity, temperature, humidity and hazardous material detection information, and

a transceiver connected to said electronics module for transmitting said data to a ground network,

whereby distribution of said selected hazardous material may be mapped and dispersion of said selected hazardous material may be predicted.

10. A method of predicting hazardous material dispersion comprising the steps of:

providing aircraft with hazardous material sensing apparatus for sensing position, altitude, wind velocity and a hazardous material mounted thereon,

collecting position, altitude, wind velocity and hazardous material data with said sensing apparatus while said aircraft flies, and

mapping distribution of said hazardous material and wind velocity from said data to predict dispersion of said hazardous material.

11. The method as set forth in Claim 10 including the steps of

providing a ground network, and

transmitting said data from said aircraft to said ground network for said step of mapping.

12. The method as set forth in Claim 10 wherein said step of mapping includes receiving weather forecast information from a weather forecast service and combining said forecast information with said data.

13. The method as set forth in Claim 10 wherein said sensing apparatus includes a global positioning system unit, a heading module and a sensor connected to said global positioning system unit and said heading module, said sensor having an airfoil shaped probe mounted to protrude outside the skin of said aircraft and an electronics module, said probe including an enclosed, positive airflow, sensing chamber with a sensing element for said hazardous material mounted therein.

14. A method of predicting hazardous material dispersion comprising the steps of:

providing aircraft with hazardous material sensing apparatus for sensing position, altitude, wind velocity and a hazardous material mounted thereon, including a global positioning system unit, a heading module and a sensor connected to said global positioning system unit and said heading module, said sensor having an airfoil shaped probe mounted to protrude outside the skin of said aircraft and

an electronics module, said probe including an enclosed, positive airflow, sensing chamber with a sensing element for said hazardous material mounted therein,

collecting position, altitude, wind velocity and hazardous material data with said sensing apparatus while said aircraft flies,

providing a ground network,

transmitting said data from said aircraft to said ground network,

receiving weather forecast information from a weather forecast service,

combining said forecast information with said data, and

mapping distribution of said hazardous material and wind velocity from said forecast information and said data to predict dispersion of said hazardous material.

15. A system for detecting and mapping distribution of a hazardous material comprising:

aircraft mounted sensing apparatus configured to collect position, altitude, wind velocity and hazardous material data, and including a global positioning system unit, a heading module, a transceiver and a sensor having a probe and an electronics module, said probe being mounted to protrude outside the skin of said aircraft, and including an enclosed, positive airflow, sensing chamber with a sensing element for said hazardous material mounted therein and pressure, temperature and humidity sensors, said electronics module being connected to and configured to receive input from said global positioning system unit, said heading module, and said probe, and to output said

data, said transceiver being configured to transmit said data, and

a ground network configured to receive said data and, from said data, to map distribution and predicted dispersion of said hazardous material.

16. The system as set forth in Claim 15 wherein said probe has an airfoil shape, and includes an outwardly located flow tube opening in the direction of airflow with said chamber being connected to and extending inwardly from said flow tube, and at least one inwardly located outlet hole connected to said chamber opposite said flow tube and opening transverse to the direction of airflow.

17. The method as set forth in Claim 15 wherein said sensing element is a plug-in, chip based hazardous agent sensor.